



UNITED STATES PATENT AND TRADEMARK OFFICE

Ch

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,704	11/29/2001	Jong Won Seok	P67356US0	2611
22429 7590 11/09/2007 LOWE HAUPTMAN HAM & BERNER, LLP 1700 DIAGONAL ROAD SUITE 300 ALEXANDRIA, VA 22314			EXAMINER HENNING, MATTHEW T	
			ART UNIT 2131	PAPER NUMBER
			MAIL DATE 11/09/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/995,704

Applicant(s)

SEOK ET AL.

Examiner

Matthew T. Henning

Art Unit

2131

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,7-9 and 12-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,7-9 and 12-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

1 This action is in response to the communication filed on 8/29/2007.

2 **DETAILED ACTION**

3 *Response to Arguments*

4 Applicant's arguments filed 8/29/2007 have been fully considered but they are not
5 persuasive.

6 Regarding applicants' argument that Lam did not disclose combining the original audio
7 signal, the echo signal of the original audio signal, and copyright information, the examiner does
8 not find the argument persuasive. First, generation of the echo signal of the original audio signal
9 is taught by the combination of Lam and Preuss, as previously presented, and is combined with
10 the error corrected watermark (copyright) information at element 98 of 5(b). Then this is
11 combined with the original audio signal in element 100 of Fig. 5(b). In the combination as
12 shown below, all three of the claimed information pieces have been combined to produce the
13 final output. As such the examiner does not find the argument persuasive.

14 Regarding applicants' argument that Lam did not disclose a sign generator configured to
15 assign a sign to the output of the linear prediction analysis filter based upon the error-corrected
16 copyright information signal, the examiner does not find the argument persuasive. Lam teaches
17 generating the error corrected copyright information in element 86, and then assigning the this
18 information either a positive or negative value (sign), as can be seen in Col. 7 Lines 63-67 of
19 Lam. Then this information is combined with the output of the LPC filter in step 98, thus
20 assigning a sign to the output of the LPC filter. As such, the examiner does not find the
21 argument persuasive.

1 Claims 1-2, 4-5, 7-9, and 12-14 have been examined.

2 Appropriate correction is required.

3 ***Claim Rejections - 35 USC § 103***

4 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all
5 obviousness rejections set forth in this Office action:

6 *A patent may not be obtained though the invention is not identically disclosed or*
7 *described as set forth in section 102 of this title, if the differences between the subject matter*
8 *sought to be patented and the prior art are such that the subject matter as a whole would have*
9 *been obvious at the time the invention was made to a person having ordinary skill in the art to*
10 *which said subject matter pertains. Patentability shall not be negatived by the manner in which*
11 *the invention was made.*
12

13 Claims 1-2, 5, 7-9, and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable
14 over Lam et al. (US Patent Number 5,940,429) hereinafter referred to as Lam, and further in
15 view of Preuss et al. (US Patent Number 5,319,735) hereinafter referred to as Preuss.

16 Regarding claim 1, Lam disclosed an apparatus for embedding a watermark into an
17 original audio signal (See Lam Fig. 5(b) element s(n)), comprising: a linear prediction analysis
18 means for generating a prediction coefficient of the original audio signal by means of a linear
19 prediction analysis after the original audio has been inputted thereto (See Lam Fig. 5(b) Element
20 88 and Col.8 Last Paragraph); a residual signal output means (See Lam Fig. 5(b) Element 104)
21 for outputting a residual signal of a the original audio signal by filtering the original audio signal
22 using the prediction coefficient generated from the linear prediction analysis means (See Lam
23 Col. 8 Line 6 – Col. 9 Line 4); an echo signal generation means (See Lam Fig. 5(b) Element 94)
24 for generating an echo signal of the original audio signal by synthesizing the prediction
25 coefficient of the original audio signal and the residual signal of the original audio signal (See

1 Lam Col. 9 Lines 43-48); and a copyright information insertion means for generating a
2 watermarked audio signal by combining the original audio signal and the echo signal of the
3 original audio signal having copyright information therein (See Lam Fig. 5(b) Element 100 and
4 Col. 9 Lines 49-53); wherein the residue signal output means further comprises: a linear
5 prediction analysis filter for outputting the residual signal by eliminating an inherent spectrum of
6 the original audio signal after filtering the original audio signal using the prediction coefficient
7 (See Lam Col. 8 Line 60 – Col. 9 Line 4); and wherein the copyright insertion means further
8 comprises: an error correction encoder configured to output an error corrected copyright
9 information signal (See Lam Fig. 5(b) Element 86 and col. 7 Lines 51-62); a sign generator
10 configured to assign a sign to the output of the linear prediction analysis filter based upon the
11 error-corrected copyright information signal (See Lam Col. 7 Line 51-67 and Col. 8 Lines 25-
12 31); and a summer configured to output a watermarked audio signal by adding the sign-assigned
13 echo signal outputted from the sign generator and the original audio signal (See Lam Col. 7
14 Lines 45-59); but Lam failed to specifically disclose a delay means for delaying the original
15 signal for a predetermined delay time; and a linear prediction analysis filter for outputting the
16 residual signal by eliminating the inherent spectrum of the delayed version of the original audio
17 signal after filtering the delayed original audio signal using the prediction coefficient.

18 Preuss teaches that in order to compensate for delays introduced by various processing
19 steps in a signal embedding system, delays can be introduced into an audio signal (See Preuss
20 Col. 6 Last Paragraph).

21 It would have been obvious to the ordinary person skilled in the art at the time of
22 invention to employ the teachings of Preuss in the audio processing system of Lam by delaying

Art Unit: 2131

1 the original audio signal $s(n)$ prior to input to element 104. This would have been obvious
2 because the ordinary person skilled in the art would have been motivated to compensate for the
3 delays introduced by the LPC analysis 88.

4 Regarding claim 8, Lam disclosed a method for embedding a watermark into an original
5 audio signal, the method comprising the steps of: a) generating a number of prediction
6 coefficients based on the original audio signal by means of the linear prediction analysis (See
7 Lam Fig. 5(b) Element 88 and Col.8 Last Paragraph); b) outputting a residual signal of the audio
8 signal by filtering the original audio signal and eliminating an inherent spectrum of the audio
9 signal, using the prediction coefficients of the original audio signal (See Lam Col. 8 Line 6 –
10 Col. 9 Line 4); c) outputting a synthesis signal using the prediction coefficients of the original
11 audio signal and the residual signal of the original audio signal (See Lam Col. 9 Lines 43-48); d)
12 applying an error correction function to the inputted copyright information to generate an error
13 corrected copyright information signal (See Lam Col. 7 Lines 51-57); e) assigning a sign to the
14 synthesis signal based upon the error corrected copyright information (See Lam Fig. 5(b)
15 Elements 90, 94, and 98 and Col. 7 Lines 63-67); and f) outputting a watermarked audio signal
16 by adding the original audio signal and the synthesis signal to which a predetermined sign has
17 been assigned (See Lam Fig. 5(b) Element 100 and Col. 9 Lines 49-53), but Lam failed to
18 disclose delaying the original audio signal prior to inputting it to element 104).

19 Preuss teaches that in order to compensate for delays introduced by various processing
20 steps in a signal embedding system, delays can be introduced into an audio signal (See Preuss
21 Col. 6 Last Paragraph).

1 It would have been obvious to the ordinary person skilled in the art at the time of
2 invention to employ the teachings of Preuss in the audio processing system of Lam by delaying
3 the original audio signal $s(n)$ prior to input to element 104. This would have been obvious
4 because the ordinary person skilled in the art would have been motivated to compensate for the
5 delays introduced by the LPC analysis 88.

6 Regarding claims 9 and 14, Lam disclosed an apparatus for detecting a copyright within a
7 watermarked audio signal, the apparatus comprising: a linear prediction analysis means for
8 generating a predetermined number of prediction coefficients based upon an inputted
9 watermarked audio signal (See Lam Fig. 6 Element 116 and Col. 14 Lines 1-7 and 16-29); a
10 linear prediction analysis filter configured to receive a watermarked audio signal, filter the signal
11 using the generated prediction coefficients and output a residual signal from which a spectrum of
12 the inputted audio signal has been eliminated (See Lam Fig. 6 Element 114 and Col. 14 Lines 7-
13 29); a short-time autocorrelation means for calculating an autocorrelation value using the
14 outputted residual signal (See Lam Fig. 6 Elements 118, 120, and 122 and Col. 14 Lines 30-42);
15 and a sign detection means for outputting a detected sign of the value (See Lam Col. 14 Lines
16 30-42), and an error correction decoder that receives the output of the sign detector means and
17 outputs error-corrected copyright information (See Lam Fig. 6 Element 126 and Col. 14 Lines
18 47-49); but Lam failed to disclose that the watermarked audio signal uses a residual signal of a
19 delayed version of the original audio signal that is delayed for a predetermined delay time (T).

20 Preuss teaches that in order to compensate for delays introduced by various processing
21 steps in a signal embedding system, delays can be introduced into an audio signal (See Preuss
22 Col. 6 Last Paragraph).

1 It would have been obvious to the ordinary person skilled in the art at the time of
2 invention to employ the teachings of Preuss in the audio processing system of Lam by delaying
3 the original audio signal $s(n)$ prior to input to element 104. This would have been obvious
4 because the ordinary person skilled in the art would have been motivated to delays introduced by
5 the LPC analysis 88.

6 Regarding claim 2, Lam and Preuss disclosed that the linear prediction analysis means
7 generates the prediction coefficient which is able to predict an inherent spectrum of the audio by
8 virtue of the linear prediction analysis (See Lam Col. 8 Lines 8-24).

9 Regarding claim 5, Lam and Preuss disclosed that the echo signal generation means is a
10 linear prediction synthesis filter for outputting the echo signal of the original audio signal by
11 synthesizing the prediction coefficient of the original audio signal outputted from the linear
12 prediction analysis means and the residual signal of the delayed version of the original audio
13 signal outputted from the residual signal output means (See Lam Col. 9 Lines 43-48).

14 Regarding claim 7, Lam and Preuss disclosed the error correction encoder outputs a value
15 according to the copyright information, the sign generator assigns a positive sign or a negative
16 sign to the echo signal of the original audio signal and the summer outputs the watermarked
17 audio signal having the copyright information therein by adding the echo signal to the original
18 audio signal or subtracting the echo signal from the original audio signal (See Lam Col. 7 Lines
19 51-67 and Col. 8 Lines 45-59, although Lam did not explicitly state "subtraction", Lam did
20 disclose assigning a negative value to the watermark data and then adding it to the original
21 signal, and adding a negative number is the same as subtraction).

5 Regarding claim 13, Lam and Preuss disclosed that the sign detection means investigates
6 a correlation sign of the residual signal of the original audio signal and the residual signal of the
7 delayed version of the original signal, thereby outputting an output value, i.e., 0 or 1, according
8 to the correlation sign (See Lam Col. 14 Lines 35-46).

9 Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of
10 Lam and Preuss as applied to claim 3 above, and further in view of Hannigan et al. (US Patent
11 Number 6,674,876) hereinafter referred to as Hannigan.

12 Regarding claim 4, Lam and Preuss disclosed delaying the audio signal prior to inputting
13 to the LPC analysis filter, but failed to disclosed the delay being a detection key to the
14 watermark.

15 Hannigan teaches that in an audio watermarking system, introduced delay times are the
16 key to the detection of the watermark (See Hannigan Col. 8 Lines 17-32).

17 It would have been obvious to the ordinary person skilled in the art at the time of
18 invention to employ the teachings of Hannigan in the watermarking system of Lam and Preuss
19 by using the introduced delay time as a key to detecting the watermark. This would have been
20 obvious because the ordinary person skilled in the art would have been motivated to protect
21 recovery of the embedded data.

22 *Conclusion*

Art Unit: 2131

1 Claims 1-2, 4-5, 7-9 and 12-14 have been rejected.

2 **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time
3 policy as set forth in 37 CFR 1.136(a).

4 A shortened statutory period for reply to this final action is set to expire THREE
5 MONTHS from the mailing date of this action. In the event a first reply is filed within TWO
6 MONTHS of the mailing date of this final action and the advisory action is not mailed until after
7 the end of the THREE-MONTH shortened statutory period, then the shortened statutory period
8 will expire on the date the advisory action is mailed, and any extension fee pursuant to 37
9 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,
10 however, will the statutory period for reply expire later than SIX MONTHS from the mailing
11 date of this final action.


12 Any inquiry concerning this communication or earlier communications from the
13 examiner should be directed to Matthew T. Henning whose telephone number is (571) 272-3790.
14 The examiner can normally be reached on M-F 8-4.

15 If attempts to reach the examiner by telephone are unsuccessful, the examiner's
16 supervisor, Ayaz Sheikh can be reached on (571) 272-3795. The fax phone number for the
17 organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2131

1 Information regarding the status of an application may be obtained from the Patent
2 Application Information Retrieval (PAIR) system. Status information for published applications
3 may be obtained from either Private PAIR or Public PAIR. Status information for unpublished
4 applications is available through Private PAIR only. For more information about the PAIR
5 system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR
6 system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

7
8
9
10
11
12
13 /Matthew Henning/
14 Assistant Patent Examiner
15 Art Unit 2131
16 11/1/2007


AYAZ SHEIKH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100